R E M A R K S

Reconsideration of this application, as amended, is respectfully requested.

THE SPECIFICATION

The specification has been amended to correct a minor error of which the undersigned has become aware. No new matter has been added, and it is respectfully requested that the amendment to the specification be approved and entered.

THE PRIOR ART REJECTION

Claims 1-28 were rejected under 35 USC 103 as being obvious over USP 7,035,292 ("Giorgetta et al") in view of USP 6,546,345 ("Ghiasi"). This rejection, however, is respectfully traversed.

The present invention as recited in independent claim 1 is directed to a trigger signal generating apparatus including a frame synchronous circuit which receives a frame signal having a predetermined bit rate and outputs a synchronous signal in synchronism with an input timing of leading data of the frame signal (e.g., element 21 in Fig. 1), a position information output circuit which receives the synchronous signal output by the frame synchronous circuit and outputs position information indicating an input bit position of the frame signal (e.g., element 22 in Fig. 1), a position designator which designates an

arbitrary bit position of the frame signal (e.g., element 23 in Fig. 1), and a trigger signal generating circuit which outputs a trigger signal at a timing when the position information output by the position information output circuit is coincident with the arbitrary bit position designated by the position designator (e.g., element 24 in Fig. 1).

The present invention as recited in independent claim 7, moreover, is directed to a frame signal waveform observation apparatus including a trigger signal generating apparatus as recited in claim 1, and a sampling oscilloscope which receives the trigger signal output from the trigger signal generating circuit of the trigger signal generating apparatus, samples the frame signal with a trigger signal input timing as a reference timing, and acquires and displays waveform information in a neighborhood of the arbitrary bit position designated by the position designator (e.g., element 25 in Fig. 1).

In addition, the present invention as recited in independent claim 15 is directed to a trigger signal generating method which comprises receiving a frame signal having a predetermined bit rate and outputting a synchronous signal in synchronism with an input timing of leading data of the frame signal, receiving the synchronous signal and outputting position information indicating an input bit position of the frame signal, designating an arbitrary bit position of the frame signal, and outputting a

trigger signal at a timing when the position information is coincident with the designated arbitrary bit position.

Still further, the present invention as defined in independent claim 21 is directed to a frame signal waveform observation method which comprises the method of claim 15 and which further comprises receiving the trigger signal, sampling the frame signal with a trigger signal input timing as a reference timing, and acquiring waveform information of the designated arbitrary bit position of the frame signal.

The present invention as recited in each of the independent claims is thus directed to processing a frame signal having a predetermined bit rate. And in particular, the claimed present invention is directed to measurement of a phase fluctuation (jitter or wander), i.e., phase variation, of a data signal (pulse signal) at a specific bit position, of a plurality of data signals which are multiplexed as frame signals for use in digital synchronous transmission systems, such as an SDH (synchronous digital hierarchy), SON ET (synchronous optical network) and OTN (optical transport network).

In a conventional technique for detecting the phase variation of a data signal, the data signal is input to an oscilloscope and a width W at a level transition portion of an eye pattern of the data signal (pulse signal) is observed (see, e.g., JP 5-145582). However, this conventional method does not

measure the phase variation of a data signal (pulse signal) at a specific position in a frame signal, but rather continuously applies the data signals that constitute frame signals to measure the phase variation of the entire frame signal. Thus, the measured phase variation is of a random noise type or dependent on the pattern of the data signal. And when observing the eye pattern described above, for example, a user can detect only a maximum value of the phase variation as a combination of both types and cannot determine the phase lead or lag at each bit position of a frame signal including predetermined bits, i.e., an actual data signal.

By contrast, the claimed present invention processes a frame signal having a predetermined bit rate, i.e., including specific bit data, and accurately acquires and observes the waveform of this frame signal at an arbitrary bit position (not the waveform of the frame signal in its entirety). More specifically, the claimed present invention provides a measurement of a phase fluctuation (jitter or wander) of a data signal (a singular pulse signal) at a specific bit position, which data signal is one of a plurality of data signals multiplexed as frame signals. For this purpose, in order to input the pulse signal at a specific bit position to an oscilloscope, a trigger signal which corresponds to the specific bit position must be generated (e.g., by the trigger signal generating circuit as recited in independent

claim 1 as described above). The trigger signal is thus output at a timing when position information indicating an input bit position of the frame signal is coincident with a designated arbitrary bit position (as recited in independent claims 1, 7, 15 and 21). In this manner, the phase variation of a data signal at a specific bit position (the arbitrary bit position) can be measured.

It is respectfully submitted that the cited prior art references do not disclose, teach or suggest generating a trigger signal that can be used to measure a phase variation of a data signal at a specific, arbitrary bit position (as opposed to the phase variation of the entire data signal), as according to the claimed present invention.

Giorgetta et al relates to acquisition of a frame signal and selection of a bit from 8 bit data in a header section of the acquired frame signal. Giorgetta et al, however, does not disclose, teach or suggest generating a trigger signal that enables measurement of a phase variation of a data signal at a specific, arbitrary bit position.

Ghiasi discloses a technique for applying a specific pulse pattern from a pulse generator to a measurement device and inputting the output from the measurement device to a digitizing oscilloscope in order to measure jitter of the pulse pattern, i.e., the phase variation of the entire pulse pattern. More

specifically, Ghiasi discloses performing jitter measurement by inputting a specific bit pattern (pattern '1111110100000010" is used in the description) from the pulse generator to the measurement device, inputting the bit pattern output from the measurement device to the digitizing oscilloscope, measuring the positional differences of bits each calculated from the transmission rate of the bit pattern, and adding them to obtain a jitter value of the entire pulse pattern. In Ghiasi, the input to the digitizing oscilloscope is therefore a signal which is output at a timing when the pulse generator outputs the specific pulse pattern.

In contrast to the claimed present invention, Ghiasi does not disclose that the input to the digitizing oscilloscope is a trigger signal at a timing when position information indicating an input bit position of a frame signal is coincident with an arbitrary bit position (as set forth in independent claims 1, 7, 15 and 21). Rather, the timing of the input to the digitizing oscilloscope in Ghiasi is significantly different than the timing of the trigger signal in the claimed invention because in Ghiasi, it is not dependent on position information indicating an input bit position of a frame signal having a predetermined bit rate or a specific, pre-designated arbitrary bit position.

Indeed, since Ghiasi does not disclose use of an arbitrary bit position, it cannot disclose generating a trigger signal at a

timing based thereon to enable measurement of phase variation of a data signal at the arbitrary bit position.

It is respectfully pointed out, moreover, that the alleged designation of an arbitrary bit position in Giorgetta et al does not provide any teaching or suggestion as to how to use this designation in the technique of Ghiasi since Ghiasi does not disclose how to measure pulse variation at an arbitrary bit position, or otherwise use the designated arbitrary bit position when generating the output signal being provided to the digitizing oscilloscope.

Accordingly, it is respectfully submitted that Giorgetta et al and Ghiasi do not disclose, teach or suggest generating a trigger signal at a timing based on position information indicating an input bit position of a frame signal and a predesignated arbitrary bit position, and that one of ordinary skill in the art would not have been able to combine the teachings of Giorgetta et al and Ghiasi to achieve the above described features of the present invention as recited in independent claims 1, 7, 15 and 21.

In view of the foregoing, it is respectfully submitted that the present invention as recited in independent claims 1, 7, 15 and 21, and claims 2-6, 8-14, 16-20 and 22-28 respectively depending therefrom, clearly patentably distinguishes over Giorgetta et al and Ghiasi under 35 USC 103.

Entry of this Amendment, allowance of the claims and the passing of this application to issue are respectfully solicited.

If the Examiner has any comments, questions, objections or recommendations, the Examiner is invited to telephone the undersigned at the telephone number given below for prompt action.

Respectfully submitted,

/Douglas Holtz/

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